

WESTERN BAY OF PLENTY DISTRICT COUNCIL

**Tuapiro Point Stormwater
Catchment Management Plan**

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File No.: 55027/1/2/24
Job No.: 43091
Date: 2006
Ref: Tuapiro Point CMP
Rev: 2

EXECUTIVE SUMMARY

The Western Bay of Plenty District Council (WBOPDC) has identified the need for stormwater catchment management in some of the smaller settlements of the Western Bay of Plenty. This document provides an overview of the Tuapiro Point stormwater catchment, describing the catchment's characteristics and stormwater network. This is the second revision of the document, the changes include revised capital works costs and the addition of maintenance costs.

Tuapiro Point is a small settlement north of Katikati with a catchment area of approximately 22 Ha. The catchment is bordered by the coast on one side and farmland on the remainder. The Tuapiro Point area is zoned rural-residential.

The existing stormwater network was modelled using the MOUSE drainage software and an ecological assessment of the catchment was prepared by Wildland Consultants.

Network upgrades were recommended as a result of the network modelling. The recommendations are based on maximum probable development using the current Western Bay of Plenty District Council Code of Practice and District Plan constraints. Should any of the current rules or controls change, stormwater discharge constraints may be required for further development.

The estimated cost of the recommended upgrade works totaled \$144,990 excl GST. This work is proposed to start in the 2006/2007 financial year and would take till the 2009/2010 financial year based on the assumed funding allocation. The maintenance cost for these upgraded assets is negligible with an additional maintenance cost per annum of under \$100 upon completion of the capital works.

The report produced by Wildland Consultants outlines recommendations for future management to protect the stormwater receiving environment. Recommendations include planting, management of the gully and bank stabilisation. The cost of the recommended work is estimated at \$27,500 excl GST, with work proposed to start in the 2006/2007 financial year and be completed in 2009/2010.

It is recommended that the works be added to the Long Term Council Community Plan (LTCCP) for the residents of Tuapiro Point to discuss and review. This should include the extra planting and the management of the gully and waterways as recommended by Wildland Consultants. The gully and waterway enhancements should be encouraged as community projects.

It is also suggested that land coverage restrictions be placed on the catchment so the impervious area of the catchment does not go above 35% (or the C factor above 0.5).

**Western Bay of Plenty District Council
Tuapiro Point Stormwater
Catchment Management Plan**

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1.0 INTRODUCTION

The Western Bay of Plenty District Council (WBOPDC) has identified the need for stormwater catchment management in some of the smaller settlements of the Western Bay of Plenty. This document provides an overview of the Tuapiro stormwater catchment, briefly describing the catchment characteristics and stormwater network.

The existing stormwater network was modelled using the MOUSE drainage software, which allowed the network and recommended upgrades to be assessed for effectiveness.

This catchment management plan also incorporates the results of an ecological assessment of the catchment prepared by Wildland Consultants in November 2003.

This report is the second revision, changes made include an update of the capital works costs for each project and the addition of maintenance costs.

2.0 DESCRIPTION OF THE CATCHMENT

Description of the Tuapiro Point

Tuapiro Point is a small settlement north of Katikati with a catchment area of approximately 22 Ha. The catchment is bordered by the coast on one side and farmland on the remainder. A map showing the location of Tuapiro Point in is Appendix A.

Soil Type and Characteristics

The soil type is predominantly Katikati sandy loam. This type of soil drains well and does not easily erode. Katikati sandy loam is suitable for residential development (including the installation of septic tanks) and horticulture such as orchards.

Land Use

The Tuapiro Point area is zoned rural-residential. The catchment has no potential for subdivision and expansion, based on district plan regulations. Appendix B is a map from the WBOPDC district plan and shows the actual zoning boundary's for Tuapiro Point.

3.0 REGULATORY INFORMATION

Western Bay of Plenty Subdivision and Development Code of Practice

The Subdivision and Development Code of Practice (COP) is in place to

“maximise efficient use of resources to ensure that any development in the district is to an appropriate long term, cost effective and minimum uniform standard which benefits the community”.

The COP outlines detailed requirements for the stormwater network. A summary of the main requirements that relate to the Tuapiro Point catchment are as follows:

- The minimum design standard for a primary (piped) stormwater system in the District is a 5 year return period (20% AEP).
- The minimum design standard for stormwater systems to protect important recreation fields, and streets without alternative access is a 10 year return period (10% AEP).
- The minimum design standard for stormwater systems to protect residential property, commercial and industrial buildings is a 50 year return period (2% AEP).
- The minimum design of stormwater systems to protect major communal facilities related to supply of electricity, telecommunications and water and sewage disposal systems and bridges is a 100 year return period (1% AEP).

Western Bay of Plenty District Plan

The rural - residential zone rules specify that no further subdivision has been provided for at Tuapiro.

The Tuapiro Point catchment is unsewered.

Environment Bay of Plenty

Environment Bay of Plenty (EBOP) has approved General Authorisation No 8 to provide for relatively small stormwater discharges. This authorisation dates back to the Water and Soil Conservation Act which permitted a Regional Council to authorise a number of minor or inconsequential uses of natural water by issuing a General Authorisation. When the Resource Management Act came into effect each General Authorisation became incorporated into the regional rules.

The provisions of General Authorisation No 8 are as follows:

“Clean stormwater may be discharged (excluding waste) into natural water provided that:

- a) The maximum discharge shall not exceed the flow from a 300 mm pipe on a flat grade or equivalent of 80 litres per second.*
- b) The suspended solids concentration of the water discharged does not exceed 150 g/m³.*
- c) The water discharged is substantially free of grease and oil.*
- d) The works shall be designed, constructed and maintained in such a manner so as not to cause erosion or flooding or to adversely affect any land or property owned or occupied by another person”.*

4.0 EXISTING INFORMATION

Stormwater Network

The catchment currently consists of 586 metres of stormwater pipe, 9 manholes and 19 catch pits. The pipes in the catchment are all currently 300 mm in diameter and were laid in 1986; the pipe material was not documented. Appendix B shows a map of the existing stormwater reticulation.

There are two discharge points in the Tuapiro Point catchment (see the Wildland report Figure 2 in Appendix C).

- Harbours Edge

A single stormwater outlet discharges the stormwater from the settlement via an underground pipe beneath the Esplanade Reserve.

- Freshwater Wetland and Stream

In the south west boundary of the catchment is a freshwater wetland. Two stormwater outlets discharge into this wetland which is mostly situated within a Recreation Reserve. The remainder is within privately owned horticultural land. A small stream flows through the wetland and discharges into the estuary.

Marine Receiving Water Quality

EBOP regularly sample five sites throughout the bathing season (the start of November till the end of March) near the Tuapiro Point catchment. The location of the sites is shown in appendix A. Following is a table showing the sampling sites, sample site number and the median enterococci value (cfu/100ml) for the 2003/2004 bathing season.

Sampling Site	Sampling Site Number	Median Enterococci Result (cfu/100mL)
Ongare Point – End of Ongare Pt Road	BOP160023	3
Tanners Point Beach	BOP160031	30
Anzac Bay –	BOP160028	24

Bowentown Domain		
Pios Ocean Beach	BOP160029	3
Athenree Motor Camp	BOP160030	9

All the sampling results are assessed against the Marine Water Quality Guidelines which are as follows:

Safe Mode	single sample < 140 cfu/100ml
Amber / Alert Mode	single sample > 140 cfu/100ml
Red / Action Mode	2 consecutive samples over 280 cfu/100ml

In the 2003/2004 bathing season only one sample was higher than 140 cfu/100ml, the rest are all under. This higher sample was taken at the Anzac Bay site and recorded 180 cfu/100ml. The following samples were back in the safe mode zone.

Ecological Characteristics

A report prepared in November 2003 by Wildland Consultants for Duffill Watts and King Ltd presented a summary of ecological information, habitat and vegetation characteristics of the Tuapiro Point area. They collated information from the Western Bay of Plenty District Plan, Bay of Plenty Regional Coastal Environment Plan (RCEP). A summary of this information is shown below.

Three significant natural areas were identified from the WBOPDC District Plan and RCEP. These are as follows (see the Wildland report Figure 1 in Appendix C):

Western Bay of Plenty District Plan

- Site S8 Tauranga Harbour Landward Edge

This area is identified as visually significant and includes all the land 40 metres inland from mean high water springs (MHWS). The Tauranga Harbour is recognised in the RCEP as an “Area of Significant Conservation or Cultural Value” and also as an “Outstanding Natural Feature or landscape”.

- Site U13/6 Ongare

This area is a protected significant ecological feature due to the range of estuarine vegetation.

Bay of Plenty Regional Coastal Environment Plan

- Site SSCMA-3 Ongare

This site is a significant marsh bird habitat area ranked as a moderate habitat quality for marsh birds.

Vegetation and Habitats

The freshwater wetland, situated off Tuapiro Road in the south western boundary of the stormwater catchment is heavily weed infested with exotic species. This includes grey willow, crack willow, hawthorn, Japanese honeysuckle, gorse, blackberry, pampas and radiata pine. The stream which flows through the wetland is highly modified and is ephemeral in nature (at the time of the study).

Species such as fernbird, pukeko, white-faced heron, Australian harrier, shining cuckoo, sparrow, song thrush and chaffinch have been sighted in the area. The banded rail was also noted in a study carried out in 1993.

5.0 CONSTRAINTS AND MODELLING ANALYSIS

The WBOPDC data for the Tuapiro catchment was adapted and used together with a detailed topographical survey of the entire catchment for the construction of a MOUSE drainage model of the area. This method of analysis allows accurate representation of existing and future systems and is only limited by the accuracy of the data used. A topographical survey of the catchment confirmed council GIS data of existing reticulation features.

The maximum probable development potential in the catchment was approximated by assuming a maximum impervious ratio of 35% (this equates to a C factor of 0.5) which is based on a statistical development figure for Katikati prior to reticulated sewerage. The maximum development potential therefore is based on current Code of Practice and District Plan requirements, should permitted activities change the recommendations may no longer be representative. The Tahawai area population is expected to grow by approximately 34% by the year 2021 absorbed by infill subdivision and rezoning. Infill subdivision is covered by the assumed maximum impervious ratio and current development constraints. Adjacent catchments are independent of the currently zoned rural - residential catchments.

The annual exceedance probability (AEP) used was 2% (i.e. equivalent to a 50 year return period) to determine potential areas of flooding. In all

cases piped reticulation was sized using a 20% AEP event, unless no safe secondary flowpath was available, in which case the 2% AEP was used.

Two models were run; the first modelled the area as it is currently and the second modelled maximum probably development if the section sizes were reduced to 800m² due to a zoning change. There was minimal difference so the second model was used for cost analysis and to produce a work programme.

It has been assumed in this study that no reticulated sewerage will be available. If this should change the recommended upgrades in this report may not meet Councils current LOS (level of service) requirements without additional constraints on private stormwater discharges.

6.0 IDENTIFIED STORMWATER PROBLEMS

Network

The MOUSE model was used to check the capacity of the existing stormwater system, determine flooding levels and identify required upgrades to the system. There is one identified floodable area, located in the back sections of several Tuapiro Road properties. This floodable area should only affect residents if further development occurs. For this reason it has been categorised low.

The removal of deficient systems has been prioritised using three categories; high, medium and low. The following criteria were used to categorise these systems.

1. High – Upgrades of deficient systems that could cause major flooding of private property if not upgraded.
2. Medium – Upgrades of deficient systems to alleviate flooding of private property.
3. Low – Upgrades of deficient systems in flooding areas that do not cause major problems and do not flood private property.

Deficient systems are those which do not meet Councils current code of practice requirements either under existing development or maximum probable development. Details of the deficient systems are listed in Appendix E and illustrated in Appendix F.

Ecological

The existing ecological values should be protected and enhanced if possible. This includes; streams, wetlands and estuaries. This will improve the quality of stormwater that is discharged into the harbour.

The health of streams and channels also needs to be considered, as there is a risk of losing ecological value of streams and channels. Erosion of the banks could also become a problem.

Pollution

No industrial or commercial areas exist at Tuapiro. Catchments are residential or rural/residential use with relatively low traffic volumes, producing limited pollution potential. No specific treatment systems are recommended other than the control of erosion caused by high velocity stormwater flows.

7.0 REMEDIAL METHODS

All recommended remedial methods are determined using maximum probable development information based on the current Code of Practice and District Plan constraints (see section 5). It is assumed that no reticulated wastewater system will be available for this area therefore minimum section sizes are 800m² (similar to Katikati before reticulated sewerage was installed).

Network

Details of the recommended upgrades, predicted costs and proposed programme are shown in appendices E and G. The Development Impact Fee (DIF) contribution is the estimated proportion of the cost of increasing the pipe sizes if subdivision was to occur. This was calculated by assessing the requirements and cost of upgrading the system to cater for existing development and comparing the results with the requirements and cost involved in upgrading the system to cater for potential maximum development. The difference between these two costs gives the total DIF amount.

The order of work listed in the proposed works programme (appendix G) was established by ranking the work based on priority. The work was then grouped so work in similar areas is carried out in consecutive years. It is possible to change the order of the work within each priority category.

Appendix F contains a map showing green coloured areas which can be developed without any upgrade of the stormwater systems. Red areas require stormwater upgrades before development can occur, or restrictions placed on new stormwater discharges.

The approximate cost of the proposed capital works is \$144,990 excl GST. This work is proposed to be started in the 2006/2007 financial year and would take 4 years based on assumed funding allocation. There is estimated to be minimal additional maintenance from these upgrades.

Ecological

The report produced by Wildland Consultants outlines recommendations for future management to protect the stormwater receiving environment. The report recommends the following to improve the ecological well being of the catchment. A full copy of the report is contained in appendix C, this contains more detail.

- Create a 10-20 m wide riparian buffer zone along stream banks to prevent sedimentation and improve aquatic and terrestrial habitat¹.
- Remove plant pests from the wetland to improve habitat quality.
- Plant undeveloped areas within the Recreation Reserve and adjacent rural land¹ to enhance the wetland habitat and to create ecological linkages with riparian and estuarine habitat.
- Utilise the undeveloped land to the southeast of the wetland as a stormwater detention area¹.

The cost of this work is expected to be around \$27,500 excl GST, with work starting in the 2006/2007 financial year and being completed in the 2009/2010 financial year. This work could become part of community projects.

8.0 RECOMMENDATION

It is recommended that the suggested capital works be added to the Long Term Council Community Plan (LTCCP) for the residents of Tuapiro Point to discuss and review the proposed works programme. This should include the extra planting recommended and the management of the gully and waterways as recommended by Wildland Consultants. The stream, channel and wetland enhancements should be encouraged as community projects. A suggested programme of works is given in Appendix G.

It is also suggested that land coverage restrictions be placed on the catchment so the impervious area of the catchment does not go above 35% (or the C factor above 0.5).

¹ Consultation and collaboration with the landowner would be required.

APPENDIX A

Location of the Tuapiro Point Catchment and EBOP Sampling Sites

APPENDIX B

Tuapiro Point District Plan Zoning Area and Existing Stormwater Pipe Network

APPENDIX C

Wildland Report “Ecological Assessment of Stormwater Catchments of Tuapiro, Western Bay of Plenty District”

APPENDIX D

Map of Floodable Areas

APPENDIX E

Recommended Stormwater Upgrades and Costs

Street name	Link		Priority	Exist size (mm)	Upgrade size (mm)	Length (m)	Pipe Cost per m	No. of man holes / Outlets	Cost per man hole	No. of catch pits	Cost per catch pit	Amount (\$)	Amount per job group (\$)
	From	To											
Tuapiro Road - Stage 1	CP0119	CO0017	Low	0.225	0.450	9	\$320	1	\$2,900	1	\$1,519.90	\$7,300	\$18,840
	CO0017	OUT1	Low	0.300	0.450	27	\$320	1	\$2,900	0	\$1,519.90	\$11,540	
Tuapiro Road - Stage 2	CP0121	CP0202	Low	0.225	0.375	10	\$240	0	\$2,900	2	\$1,519.90	\$5,440	\$24,870
	CP0202	OUT2	Low	0.300	0.375	39	\$240	1	\$2,900	0	\$1,519.90	\$12,260	
	CPB	MH0053	Low	0.300	0.825	5	\$550	1	\$2,900	1	\$1,519.90	\$7,170	
Tuapiro Road - Stage 3	CP0208	MH0052	Low	0.225	0.525	10	\$350	1	\$2,900	1	\$1,519.90	\$7,920	\$86,600
	MH0052	MH0053	Low	0.300	0.675	72	\$420	1	\$2,900	0	\$1,519.90	\$33,140	
	MH0053	CO0019	Low	0.300	0.825	65	\$550	1	\$2,900	0	\$1,519.90	\$38,650	
	CPA	CPB	Low	0.225	0.825	7	\$550	0	\$2,900	2	\$1,519.90	\$6,890	
Tuapiro Road - Stage 4	MH0056	CO0021	Low	0.300	0.375	37	\$240	2	\$2,900	0	\$1,519.90	\$14,680	\$14,680
Total												\$144,989	\$144,989

Cost Covered by DIF's \$35,087
Cost Covered by current residents \$109,902

Maintenance Costs for the Additional Service

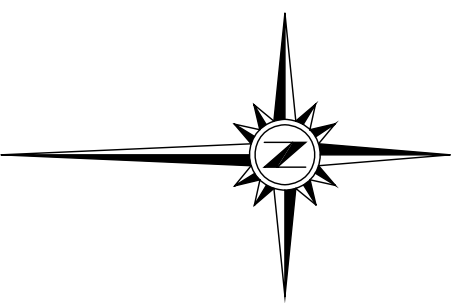
Year	Additional Cost per annum	Additional Costs - Cumulative
2006/2007	\$25	\$25
2007/2008	\$39	\$64
2008/2009	\$6	\$70

APPENDIX F

Map of Recommended Stormwater Upgrades

APPENDIX G

Proposed Works Programme



Tauranga Harbour

Tauranga Harbour

Foreshore
TUAPIRO ROAD

Foreshore

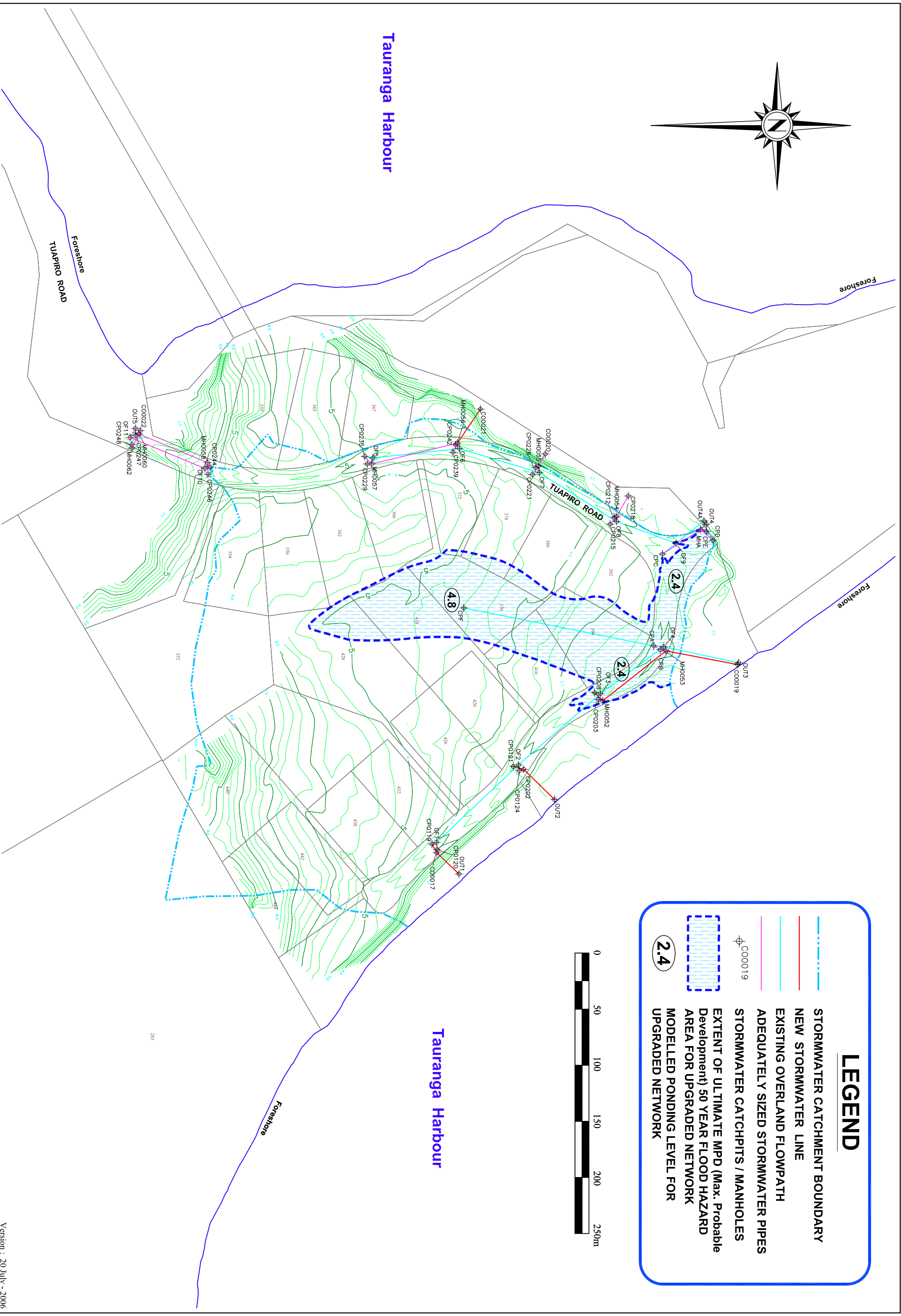
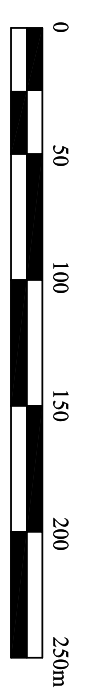
Foreshore

Foreshore

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LEGEND

- STORMWATER CATCHMENT BOUNDARY
- NEW STORMWATER LINE
- EXISTING OVERLAND FLOWPATH
- ADEQUATELY SIZED STORMWATER PIPES
- STORMWATER CATCHPITS / MANHOLES
- EXTENT OF ULTIMATE MPD (Max. Probable Development) 50 YEAR FLOOD HAZARD AREA FOR UPGRADED NETWORK
- MODELLED PONDING LEVEL FOR UPGRADED NETWORK



Project No. : 43078.05.04.01
 Dwg. File : Coastal Areas P01-4-floodable.dwg Tupiro Pt. P01

Scales: ~ 1:1500 (A1)
 ~ 1:3000 (A3)



Project
**TUAPIRO POINT CATCHMENT
 MANAGEMENT PLAN**

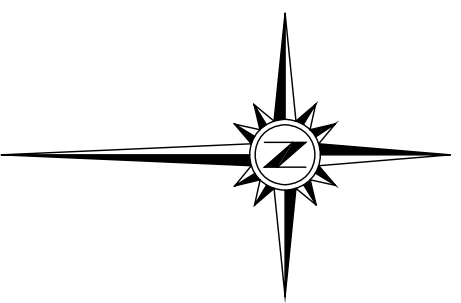
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 (UPGRADED NETWORK)**

Job No.
43078

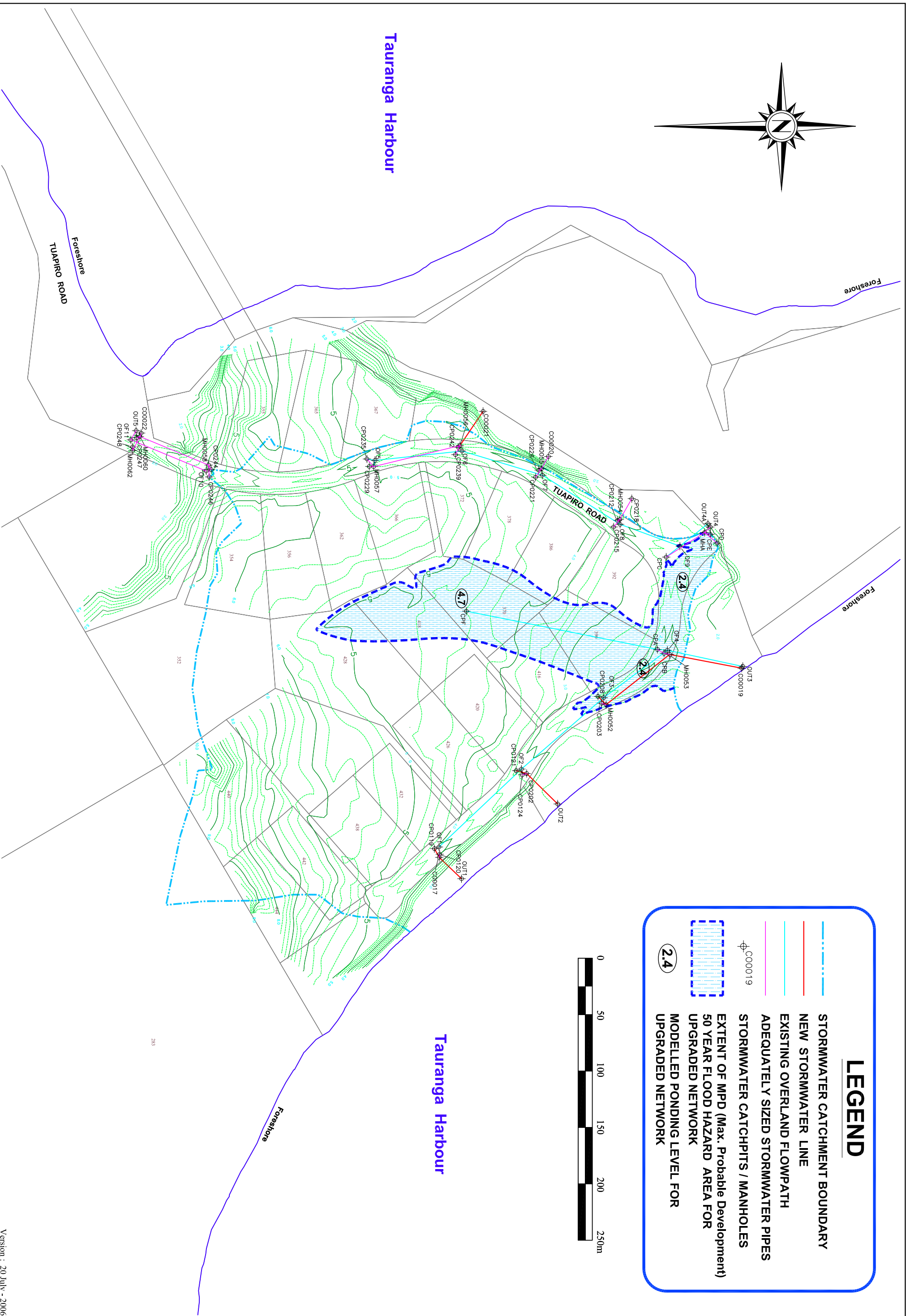
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 2 of 5 sheets










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Tauranga Harbour



LEGEND

-  STORMWATER CATCHMENT BOUNDARY
-  NEW STORMWATER LINE
-  EXISTING OVERLAND FLOWPATH
-  ADEQUATELY SIZED STORMWATER PIPES
-  STORMWATER CATCHPITS / MANHOLES
-  EXTENT OF MPD (Max. Probable Development) 50 YEAR FLOOD HAZARD AREA FOR UPGRADED NETWORK
-  MODELLED PONDING LEVEL FOR UPGRADED NETWORK



2.4

Project No. : 43078.05.04.01
 Dwg. File : Coastal Areas P01-4-floodable.dwg Tuapiro Pt. P01



Client
 Project
**TUPIRO POINT CATCHMENT
 FLOOD HAZARD AREA
 MANAGEMENT PLAN**

Sheet Title
**PLAN
 FLOOD HAZARD AREA
 (UPGRADED NETWORK)**

Job No.
 43078

Sheet No.
 P01
 1 of 5 sheets



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